What is claimed is:

[Claim 1] 1. A polarization conversion light pipe device suited for LCD- or LCoS-based projection systems, the polarization conversion light pipe device comprising:

a light tunnel defined by four side reflective mirrors, wherein the light tunnel has a rectangular cross section and has a light entrance face and a light exit face;

a front reflective mirror mounted at the light entrance face, wherein the front reflective mirror has an aperture where light emanated from a light source is condensed thereto and enters the light tunnel;

a retardation plate situated within the light tunnel; and

a polarization beam splitter module comprising at least one polarization beam splitting surface that is substantially 45 degree-inclined with respect to one of the side reflection mirrors, wherein the polarization beam splitter module is located within the light tunnel between the retardation plate and the light exit face.

[Claim 2] 2. The polarization conversion light pipe device according to claim 1 wherein the retardation plate rotates direction of an electric field of an incident polarized light.

[Claim 3] 3. The polarization conversion light pipe device according to claim 1 wherein the polarization beam splitter module is a wire grid polarizer.

[Claim 4] 4. The polarization conversion light pipe device according to claim 1 wherein the polarization beam splitter module comprises a polarization beam splitter (PBS) element.

[Claim 5] 5. The polarization conversion light pipe device according to claim 4 wherein the PBS element comprises a 90-45-45 degree triangle prism.

[Claim 6] 6. The polarization conversion light pipe device according to claim 1 wherein the retardation plate is adhered to the polarization beam splitter module.